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10/816,487

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Katrina Mikhaylichenko

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EXAMINER

MACARTHUR, SYLVIA

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/816,487	Applicant(s) MIKHAYLICHENKO ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Clarification of Previous Action

1. The examiner wishes to clarify that the action of 11/14/2007 was a non-final action despite the error of stating it was a final in paragraph #9 in the body of the action.

1. Applicant's arguments, with respect to the prior art of record not teaching or suggesting a channel or a plurality of channels disposed within the heater, see the paragraph joining pages 8 and 9. Note the prior art Balance et al (US 6,090,210) teaches a heating portion (heater with a plurality of lamps) in the showerhead see Figure 1 wherein channels (tubes 46) are provide between the lamps in the heating portion to provide heat transfer (cooling). The prior art of Balance et al is introduced to show that it is convention to introduce channels within a heating portion to provide better temperature control.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 10 recites the limitation "the channel" in lines 6 and 10. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 15 recites the limitations "the first channel" and "the second channel" in lines 3 and 4. There is insufficient antecedent basis for this limitation in the claim.

6. Claim 17 recites the limitation "the channel" in lines 9 and 13. There is insufficient antecedent basis for this limitation in the claim.

Double Patenting

7. Claims 10, 16, 17, and 21 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15-20 of copending Application No. 11/061,944 (USPub No. 2002/0124153) held to Yun et al in view of Yuji et al (JP 2001-220688) and de Larios et al (US 6,488, 040) and Balance et al(US 6,090,210).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the present invention is narrower than the application by Yun et al.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Yun et al teaches a proximity head connected to a fluid source wherein the head further includes a heating element, see claims 15 and 17 of the co-pending application.

Regarding claims 10, 16, and 21: Yun et al fails to teach a sensor.

Yuji et al teaches a spraying nozzle (also a fluid distributor) with a heat source 12. According to [0030] the heater is equipped with a thermocouple 13 (temperature sensor). Moreover, [008] teaches that each heater 12 has a thermocouple thus allowing the concentration of the reactive fluid and temperature to be controlled correctly and the film property of the thin film and uniformity of treatment attained. Furthermore, the motivation to use the heating portion/temperature thermometer of Yuji et al in the proximity head of Yun et al is that the temperature of the processing fluid is an important processing parameter that when monitored

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can improve the processing result. Thus, it would have been obvious to modify the proximity head of de Larios et al to include a heater with a temperature sensor.

Yun et al as modified by Yuji et al further fails to claim the inlets/outlets as recited in claim 10.

De Larios et al teaches capillary proximity heads. The proximity head having inlets and outlets as illustrated in Figs 6-8. The motivation to use the proximity head of de Larios in the apparatus of Yun et al in view of Yuji et al is that it provides a means of cleaning and drying a wafer simultaneously as recited by the title and in col. 4 lines 31-45. Thus, it would have been obvious for one ordinary skill in the art at the time of the claimed invention to combine the teachings of Yun et al, Yuji et al and de Larios to provide a capillary proximity heater with a heater/temperature sensor component in the head.

Regarding claim 17: The apparatus of Yun et al comprises a fluid source, a proximity head with a heater, a first member manipulating the proximity head and a second member that manipulates the wafer support, see claims 15-17 of Yun et al.

The combination of Yun et al with Yuji et al and de Larios fails to teach channels within the heating portion.

Note the prior art Balance et al (US 6,090,210) teaches a heating portion (heater with a plurality of lamps) in the showerhead see Figure 1 wherein channels (tubes 46) are provide between the lamps in the heating portion to provide heat transfer (cooling). The prior art of Balance et al is introduced to show that it is convention to introduce channels within a heating portion to provide better temperature control.

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Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide channels within the heating portion in order to provide enhance temperature control of the heater and the fluid transferred therethrough.

4. Claims 11-14, 18, and 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15-20 of copending Application No. 11/061,944 held to Yun et al in view of Yuji et al , De Larios and Balance et al(US 6,090,210)as applied to claims 10, 16, and 17 above, in further view of Kawamura et al (US 5,696,348).

The teachings of Yun et al in view of Yuji et al, de Larios et al and Balance et al.

Yun et al in view of Yuji et al fails to teach the material of construction of the heater with a thermocouple/thermometer.

Kawamura et al teaches a thermocouple constructed of a protective pipe made of SiC see col. 2 lines 65. The motivation to use SiC as the material of construction is that is a known heat resistant ceramic material. Kawamura et al further teaches the thermocouple comprises wires, see the abstract. These wires are for coupling to a power supply see col.3 lines 38-40. In order to be used to conduct electricity the wires are obviously made of an electrically conductive material. Thus, it would have been obvious to construct the heater/temperature sensor of the materials taught by Kawamura et al with wires and a protective coating to provide electricity to the heater/sensor while protecting it from the harsh physical/chemical environment of the semiconductor manufacturing system.

5. Claims 15 and 20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15-20 of copending Application No.

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11/061,944 (USPub No. 2002/0124153) held to Yun et al in view of Yuji et al ,de Larios et al (US 6,488, 040), , Balance et al(US 6,090,210)and Kenji et al JP 08-277486. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the present invention is narrower than the application by Yun et al.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The teachings of Yun et al in view of Yuji et al , de Larios and Balance et al were discussed above. This modification fails to teach a plurality of channels that are separate in the heating portion.

The apparatus of Kenji et al teaches a plating device with heaters 11 (the totality of which is interpreted as the heating portion) that comprises separate channels, see Figs. 1-3. The motivation to modify the apparatus of Yun et al in view of Yuji et al and de Larios with the apparatus of Kenji et al is that this configuration of a heating portion allows for the substrate to be heated more rapidly. See the English Abstract of Kenji et al and [0018]. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Yun et al in view of Yuji et al and de Larios with the plurality of separate channels in the heating portion of Kenji et al.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over de Larios et al US 6,488,040 in view of Yuji et al (JP 2001-220688, using the examiner provided English Translation) and Balance et al(US 6,090,210).

De Larios et al teaches capillary proximity heads. The proximity head (a fluid distributor) having inlets and outlets as illustrated in Figs 6-8.

Re claim 10: DeLarios fails to teach the proximity head comprises a heating portion.

Yuji et al teaches a spraying nozzle (also a fluid distributor) with a heat source 12. According to[0030] the heater is equipped with a thermocouple 13 (temperature sensor). Moreover, [008] teaches that each heater 12 has a thermocouple thus allowing the concentration of the reactive fluid and temperature to be controlled correctly and the film property of the thin film and uniformity of treatment attained. Furthermore, the motivation to use the heating portion/temperature thermometer of Yuji et al in the proximity head of de Larios is that the temperature of the processing fluid is an important processing parameter that when monitored can improve the processing result. Thus, it would have been obvious to modify the proximity head of de Larios et al to include a heater with a temperature sensor.

The combination of de Larios and Yuji et al fails to teach channels within the heating portion.

Note the prior art Balance et al (US 6,090,210) teaches a heating portion (heater with a plurality of lamps) in the showerhead see Figure 1 wherein channels (tubes 46) are provide between the lamps in the heating portion to provide heat transfer (cooling). The prior art of Balance et al is introduced to show that it is convention to introduce channels within a heating portion to provide better temperature control.

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Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide channels within the heating portion in order to provide enhance temperature control of the heater and the fluid transferred therethrough.

Regarding claims 16 and 21: The thermocouple of Yuji comprises a controller 14 had heat controller 15 as a part of its structure and function of detecting the temperature.

7. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun et al or deLarios in view of Yuji et al and Balance et al as applied in claims 10 and 16 above, in view of Kawamura et al.

The teachings of de Larios in view of Yuji et al and Balance et al were discussed above.

This modification fails to teach the material of construction of the heater with a thermocouple/thermometer.

Kawamura et al teaches a thermocouple constructed of a protective pipe made of SiC see col. 2 lines 65. The motivation to use SiC as the material of construction is that is a known heat resistant ceramic material. Kawamura et al further teaches the thermocouple comprises wires, see the abstract. These wires are for coupling to a power supply see col.3 lines 38-40. In order to be used to conduct electricity the wires are obviously made of an electrically conductive material. Thus, it would have been obvious to construct the heater/temperature sensor of the materials taught by Kawamura et al with wires and a protective coating to provide electricity to the heater/sensor while protecting it from the harsh physical and chemical environment of the semiconductor manufacturing system.

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8. Claims 15, 17, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over deLarios in view of Yuji et al and Balance et al as applied in claims 10 and 16 above, in further view of Kenji et al (JP 08-277486).

The teachings of de Larios in view of Yuji et al and Balance et al were discussed above.

This modification fails to teach:

Regarding Claims 15 and 20- a plurality of channels that are separate in the heating portion. The apparatus of Kenji et al teaches a plating device with heaters 11 (the totality of which is interpreted as the heating portion) that comprises separate channels, see Figs. 1-3. The motivation to modify the apparatus of Yun et al in view of Yuji et al and de Larios with the apparatus of Kenji et al is that this configuration of a heating portion allows for the substrate to be heated more rapidly. See the English Abstract of Kenji et al and [0018]. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of deLarios as modified by Yuji et al and Ballance et al with the plurality of separate channels in the heating portion of Kenji et al.

Regarding claim 17- a first and second member as claimed in the present invention. See first member of Kenji et al is the vertical displacement device used to vertically move the proximity head of Kenji et al see Figs. 1-3 and the second member (press block 1 and/or jig 4) that support lead frame 2 (substrate). The motivation to provide the first and second members of the prior art of Kenji et al is that these members allow for better control of the spacing between the proximity head (fluid distribution member includes injection nozzles 5). Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use the teachings of Kenji et al to provide a more efficient way to treat the substrate.

Regarding claim 21: Recall Yuji et al teaches a sensor (thermocouple 13) is coupled to controller 14 (thermometry machine) and heat controller 15.

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over deLarios in view of Yuji et al, Kenji et al, and Ballance et al as applied in claims 15,17, 20, and 21 above, in further view of Kawamura et al.

The teachings of de Larios in view of Yuji et al, Kenji et al, and Ballance et al were discussed above.

This modification fails to teach the material of construction of the heater with a thermocouple/thermometer.

Kawamura et al teaches a thermocouple constructed of a protective pipe made of SiC see col. 2 lines 65. The motivation to use SiC as the material of construction is that is a known heat resistant ceramic material. Kawamura et al further teaches the thermocouple comprises wires, see the abstract. These wires are for coupling to a power supply see col.3 lines 38-40. In order to be used to conduct electricity the wires are obviously made of an electrically conductive material. Thus, it would have been obvious to construct the heater/temperature sensor of the materials taught by Kawamura et al with wires and a protective coating to provide electricity to the heater/sensor while protecting it from the harsh physical and chemical environment of the semiconductor manufacturing system.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. The amendment reciting the liquid meniscus suggests capillary action. The

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introduction of the prior art of de Larios et al was necessitated by the amendment. Accordingly,

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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June 9, 2008

/Sylvia R MacArthur/
Primary Examiner, Art Unit 1792